PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 47473	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/IT2005/000028	International filing date *(day/month/year)* 20.01.2005	Priority date *(day/month/year)* 21.01.2004
International Patent Classification (IPC) or national classification and IPC B65H19/18		
Applicant FABIO PERINI S.P.A.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 4 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand 17.08.2005	Date of completion of this report 23.02.2006
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Haaken, W Telephone No. +31 70 340-4278

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/IT2005/000028

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:

   ☐ international search (under Rules 12.3 and 23.1(b))
   ☐ publication of the international application (under Rule 12.4)
   ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-10 as originally filed

Claims, Numbers

1-27 received on 07.02.2006 with letter of 01.02.2006

Drawings, Sheets

1/6-6/6 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

   ☐ the description, pages
   ☐ the claims, Nos.
   ☐ the drawings, sheets/figs
   ☐ the sequence listing *(specify)*:
   ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

   ☐ the description, pages
   ☐ the claims, Nos.
   ☐ the drawings, sheets/figs
   ☐ the sequence listing *(specify)*:
   ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-27
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-27
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-27
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (SEPARATE SHEET)

International application No.
PCT/IT2005/000028

Re Item V.

1 Reference is made to the following documents:
D1 : US 2 205 867 A (SCOTT WALTER C) 25 June 1940 (1940-06-25)
D2 : US 3 172 613 A (J.M. SIMONS ET AL) 9 March 1965 (1965-03-09)

Closest prior art

Document D1 discloses (the references in parentheses applying to this document):
an unwinding device for unwinding reels of web material, comprising:
- a rotating element (11,12) with supports (29, 30) for at least two reels;
- a splicing member to join a first web material (18) coming from an expiring reel (though this is not depicted in the drawing, it is however implicitly disclosed in the text, see right-hand column on page 2, line 10-18) to the initial free end of a second web material wound on a new reel,
wherein at least one mechanical member (20-27) is associated with each support (29, 30), to retain the free end of the reel disposed on said support (cf. **claim 1**).

D1 furthermore discloses
a method for continuously feeding a web material wound on a reel (15, 16, 17) to a (not depicted) processing machine, comprising the phases of:
- feeding a first web material at a speed from a first reel;
- carrying in rotation a second reel with a second web material;
- when the feed speed of the first web material is essentially the same as the peripheral speed of the second reel, joining the first web material to the second web material and interrupting the first web material upstream of the splicing area between the first and the second material (this method steps well of the preamble describe the usual so-called flying splicing),
comprising as well holding the initial free end of the second web material adherent to the second reel, until splicing of the first and of the second material, by means of at least one mechanical member (20-27) which rotates with said second reel; and carrying said at least one mechanical member to an idle position after said splicing (see especially right-hand column on page 2, line 10-18) (cf. **claim 17**).

Problem

When tissue paper is spliced, only the outer layers of both the webs are attached to each other. Hence, the individual layers of the tissue paper may delaminate at the splicing location.

Solution

Before splicing the webs to each other, the different plies (=layers) of the end portion of the first web are joined together by ply-bonding before the web is spliced to the second web, so that at least at the trailing edge of the second web delamination is prevented.

Inventive Step

The subject matter of independent apparatus claim 1 and independent method claim 17 is novel over the prior art.The same applies accordingly to the dependent claims.

The prior art does not even mention the problem. Also with the knowledge of the problem, the skilled person would not have been prompted to a solution according to the independent apparatus claim 1 or the independent method claim 17. Hence, the subject matter of these calims involves an inventive step. The same applies accordingly to the dependent claims.

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PCT/IT2005/000028
Fabio Perini s.p.a.
Our file 47473-wo-01/2006

Amended CLAIMS

1. An unwinding device for unwinding reels of web material, comprising:

– a rotating element (3) with supports (13, 15) for at least two reels (B1; B2; B3), said rotating element additionally carrying at least two rollers (17, 19);

– a splicing member (31, 33, 35) to join a first web material (N1) coming from an expiring reel (B1) to the initial free end (T) of a second web material (N2) wound on a new reel (B2);

– at least one mechanical member (21) associated with each support (13; 15), to retain the initial free end (T) of the reel disposed on said support; characterized in that a ply-bonding unit (37) is provided, which includes ply-bonding wheels (37), particularly for joining the plies of the expiring web material together stably before splicing to the new web material, said ply-bonding wheels (37) cooperating alternatively with the respective one of said rollers.

2. Device according to claim 1, characterized in that said rotating element (3) includes a pair of arms (9, 11) supporting said rollers (17, 19).

3. Device according to claim 2, characterized in that said rotating element (3) includes a further pair of arms (5, 7) carrying said supports (13, 15).

4. Device according to claim 1, 2 or 3, characterized in that said ply-bonding unit (37) is designed and controlled to stably join together the plies of said first web material (N1) coming from said expiring reel (B1) before splicing to the second web material (N2) coming from the new reel (B2).

5. Device according to claim 4, characterized in that said ply-bonding unit is arranged to act immediately upstream of the splicing member (31, 33, 35).

6. Device as claimed in one or more of the previous claims, characterized in that said at least one mechanical member (21) comprises at least one arm (23) extending radially from the respective support (13; 15) and

at least one retaining element (25) carried by the free end of said at least one arm, said retaining element (25) extending substantially parallel to the axis of the reel.

7. Device as claimed in claim 6, characterized in that said retaining element (25) is a roller.

8. Device as claimed in claim 7, characterized in that said roller is supported idle on said arm.

9. Device as claimed in claim 6 or 7, characterized in that said arm is adjustable in length.

10. Device as claimed in one or more of the previous claims, characterized in that said at least one mechanical member is torsionally connectable to the respective support and releasable therefrom, to rotate with the reel or to remain in an idle condition while the reel rotates.

11. Device as claimed in one or more claims 6 to 10, characterized in that said retaining element (25) is movable with respect to the arm (23).

12. Device as claimed in claim 11, characterized in that said retaining element cooperates with an actuator (89) which controls withdrawal of the retaining element from the respective reel when the web material wound thereon is joined to the web material of the expiring reel, withdrawal releasing the retaining element from the reel.

13. Device as claimed in one or more of claims 1 to 5, characterized in that said mechanical member comprises an elastic element (25).

14. Device as claimed in claim 13, characterized in that said elastic member is connectable reversibly at one end to be released when the initial free end of the web material of the respective reel is to be joined to the web material of the other reel.

15. Device as claimed in claim 13 or 14, characterized in that two hooking members of said elastic member are associated with each support of said reels, one of said hooking members (91) cooperating with an actuator (89) which controls release of the elastic member.

16. Device as claimed in one or more of the previous claims, characterized in that said splicing member (31, 33, 35) comprises a roller (33) and a cutting blade (35) to cut the web material (N1) coming from the expiring reel (B1).

17. Method for continuously feeding a web material wound on a reel to a processing machine, comprising the phases of:

- feeding a first web material (N1) at a feed speed from a first reel (B1);
- carrying in rotation a second reel (B2) with a second web material (N2);
- when the feed speed of the first web material (N1) is essentially the same as the peripheral speed of the second reel (B2), joining the first web material (N1) to the second web material (N2) and interrupting the first web material upstream of the splicing area between the first and the second web material.

wherein the initial free end (T) of the second web material (N2) is held adherent to the second reel (B2), until splicing of the first and of the second web material, by means of at least one mechanical member (21) which rotates with said second reel (B2); and carrying said at least one mechanical member to an idle position after said splicing;

characterized in that each of said web materials (N1, N2) is composed of more than one ply and the plies of the end portion of the first web material are joined together by ply-bonding before splicing to the second web material.

18. Method as claimed in claim 17, characterized by: arranging said first reel and said second reel on a rotating element (3) having supports (13, 15) for at least said two reels; providing, on said rotating element, two rollers (17; 19); arranging a ply-bonding unit (37) including ply-bonding wheels for cooperation alternatively with one or the other of said two rollers (17, 19); controlling said ply-bonding unit to stably join together the plies of said frist web material (N1) coming from said first reel (B1) before splicing to the second web material (N2) coming from said second reel (B2).

19. Method as claimed in claim 17 or 18, characterized in that an adhesive means (BA) is applied to the external surface of the second reel (B2) in a withdrawn position, in the direction of rotation of the reel, with respect to the position in which said mechanical member (21) holds the initial free end (T) of the second web material (N2).

20. Method as claimed in claim 19, characterized in that the first and the second web material are pressed together at the level of said adhesive means to cause splicing of said web materials.

21. Method as claimed in one or more of claims 17 to 20,

characterized in that each of said plies is made of tissue paper and has a weight per unit of surface ranging from 15 to 60 g/m^2 and preferably from 15 to 30 g/m^2.

22. . Method as claimed in one or more of claims 17 to 21, characterized in that said mechanical member (21) is torsionally connected to a support (13; 15) of the reel rotating therewith, and said mechanical member is released from said support during splicing of the first and of the second web material.

23. Method as claimed in one or more of claims 17 to 22, characterized in that said mechanical member is torsionally connected to the respective reel and said mechanical member is released from said reel during splicing of the first and the second web material, withdrawing the mechanical member from the external surface of the respective reel.

24. Method as claimed in one or more of claims 17 to 23, characterized in that the initial free end of the web material is held by means of an elastic mechanical member.

25. Method as claimed in claim 24, characterized in that one end of the elastic mechanical member is released during splicing of the first and the second web material.

26. Method as claimed in one or more of claims 17 to 25, characterized in that a pressure member (33) is used to act on the surface of said second reel at least in an area between said mechanical retaining member and an area of reciprocal adhesion (BA) between the first and the second web material.

27. Method as claimed in claim 26, characterized in that a strip of double-sided adhesive tape is applied to the external surface of said second reel, in said area of reciprocal adhesion.